

What is claimed as new and desired to be protected by Letters Patent of the United States is:

1. A fuel injection device comprising:

an intake pipe having interior wall surfaces for providing air from an upstream side to a downstream side;

a fuel injection port disposed in said intake pipe between said surfaces for providing fuel into said intake pipe; and

an air guide member disposed in said intake pipe in a plane substantially parallel to said surfaces for guiding air separately towards an air flow layer passage and a main air passage wherein said air guided towards said air flow layer passage has a speed at least greater than said air guided towards said main air passage.

2. The device of claim 1 wherein said air flow layer passage on said upstream side has a greater cross sectional area than said air flow layer passage on said downstream side.

3. The device of claim 1 wherein said fuel injection port is provided in said main air passage.

4. The device of claim 1 further comprising an air quantity control

valve disposed in said main air passage.

5. The device of claim 1 wherein said air flow layer passage is a bypass pipe bypassing said intake pipe.

6. The device of claim 5 wherein said bypass pipe bypasses a throttle valve disposed in said intake pipe.

7. The device of claim 5 further comprising an air flow layer control valve disposed in said bypass pipe.

8. An engine system comprising:

an engine control unit;

10 a fuel injection device electrically coupled to said engine control unit for regulating fuel injection, said device comprising:

an intake pipe having interior wall surfaces for providing air from an upstream side to a downstream side;

15 a fuel injection port disposed in said intake pipe between said surfaces for providing fuel into said intake pipe; and

an air guide member disposed in said intake pipe in a plane substantially parallel to said surfaces for guiding air separately towards an air

flow layer passage and a main air passage wherein said air guided towards said air flow layer passage has a speed at least greater than said air guided towards said main air passage.

5           9. The engine of claim 8 wherein said air flow layer passage on said upstream side has a greater cross sectional area than said air flow layer passage on said downstream side.

10           10. The engine of claim 8 wherein said fuel injection port is provided in said main air passage.

10           11. The engine of claim 8 further comprising an air quantity control valve disposed in said main air passage.

12. The engine of claim 8 wherein said air flow layer passage is a bypass pipe bypassing said intake pipe.

13. The engine of claim 12 wherein said bypass pipe bypasses a throttle valve disposed in said intake pipe.

15           14. The engine of claim 12 further comprising an air flow layer control valve disposed in said bypass pipe.

15. A fuel injection device comprising:

an intake pipe having interior wall surfaces for providing air from an upstream side to a downstream side;

a fuel injection port disposed in said intake pipe between said surfaces for providing fuel into said intake pipe;

5                    an air guide member disposed in said intake pipe in a plane substantially parallel to said surfaces for guiding air separately towards an air flow layer passage and a main air passage wherein said air guided towards said air flow layer passage has a speed at least greater than said air guided towards said main air passage; and

10                   wherein said air flow layer passage on said upstream side has a greater cross sectional area than said air flow layer passage on said downstream side.

16. An engine system comprising:

an engine control unit;

15                   a fuel injection device electrically coupled to said engine control unit for regulating fuel injection, said device comprising:

an intake pipe having interior wall surfaces for providing air from an upstream side to a downstream side;

a fuel injection port disposed in said intake pipe between said surfaces for providing fuel into said intake pipe;

an air guide member disposed in said intake pipe in a plane substantially parallel to said surfaces for guiding air separately towards an air flow layer passage and a main air passage wherein said air guided towards said air flow layer passage has a speed at least greater than said air guided towards said main air passage; and

wherein said air flow layer passage on said upstream side has a greater cross sectional area than said air flow layer passage on said downstream side.

17. An intake pipe having interior wall surfaces for providing air comprising:

an air guide member disposed in said intake pipe in a plane substantially parallel to said surfaces for guiding air separately towards an air flow layer passage and a main air passage wherein said air guided towards said air flow layer passage has a speed at least greater than said air guided towards said main air passage for guiding an injected fuel away from said surfaces.

18. An engine system comprising:

an engine control unit;

an air intake control unit coupled to said engine control unit for regulating air intake, said air intake control unit being coupled to an intake pipe having interior wall surfaces for providing air, said intake pipe comprising:

- 5            an air guide member disposed in said intake pipe in a plane substantially parallel to said surfaces for guiding air separately towards an air flow layer passage and a main air passage wherein said air guided towards said air flow layer passage has a speed at least greater than said air guided towards said main air passage for guiding an injected fuel away from said surfaces.